

# Application of three entomopathogenic fungi for aphid control

T. BAWIN<sup>1</sup>, F. SEYE<sup>1,2</sup>, S. BOUKRAA<sup>1</sup>, J.-Y. ZIMMER<sup>1</sup>, F. DELVIGNE<sup>3</sup>, M. NDIAYE<sup>2</sup>, F. FRANCIS<sup>1</sup>

<sup>1</sup> Functional and Evolutionary Entomology – University of Liege (GxABT) – Gembloux (Belgium)

<sup>2</sup> Reproductive biology – University Cheikh Anta Diop – Dakar Fann (Senegal)

<sup>3</sup> Bio-Industries/CWBI – University of Liege (GxABT) – Gembloux (Belgium)

Email: entomologie.gembloux@ulg.ac.be



## Introduction

- Aphids (Homoptera: Aphididae) are sap-sucking insect pests that feed on several plants of agronomical importance
- Chemical pesticide application is the most commonly used method for aphid control
- Integrated pest management including biological control is now promoted
- Entomopathogenic fungi are valuable tools for potential aphid control

## Objectives

As part of a selection process, 3 new isolated fungal strains (*Metarhizium* and *Aspergillus* genus) are tested against *Acyrtosiphon pisum* aphids and compared regarding their:

- insecticidal activity
- impact on adult's fitness

## Materials & Methods

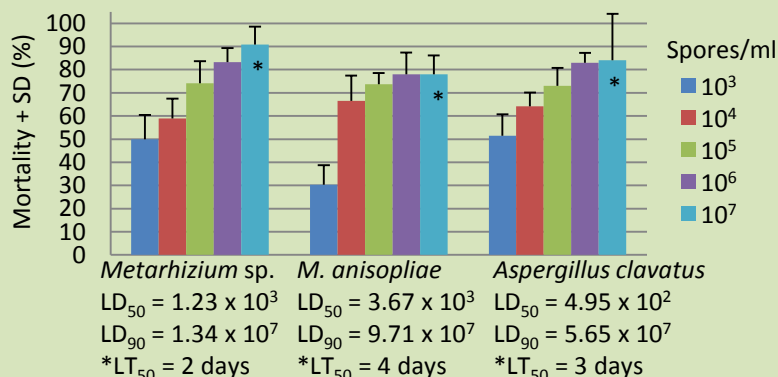
- Fungi were cultivated on wheat bran media in flasks up to sporulation
- The solid media were washed with aqueous solutions containing 0.05% Tween 80 before filtration
- The content of conidia in filtrates was determined by haemocytometer
- Doses ranging from  $10^3$  to  $10^7$  conidia/ml were then sprayed on young plants with 20 adult parthenogenetic aphids
- Batches were incubated at a 16L/8D photoperiod,  $25 \pm 2^\circ\text{C}$  and 75-80% RH

## Survey data

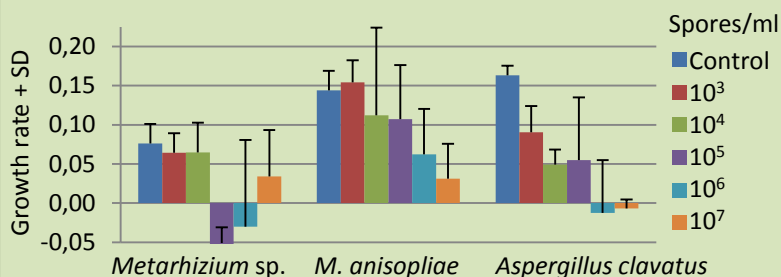
- Adult mortality was assessed and corrected with Abbott formula in order to determine  $LD_{50}$ ,  $LD_{90}$  and  $LT_{50}$  values
- The number of nymphs produced was daily recorded and expressed as intrinsic growth rate

## Results

### 1. *Acyrtosiphon pisum* aphids mortality after 5 days of exposure to *Metarhizium* and *Aspergillus* strains depending on tested doses



### 2. *Acyrtosiphon pisum* aphids growth rate after 5 days of exposure to *Metarhizium* and *Aspergillus* strains depending on tested doses



## Conclusions

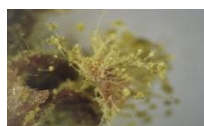
- Fungal isolates induced *A. pisum* mortality with a similar impact
  - A. clavatus* infection statistically seemed to alter adults' fitness
- This suggests that these fungi may be candidates for aphid control

## Perspectives

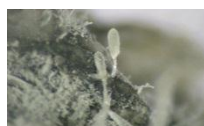
- Further investigations should be made in order to assess their host range specificity
- Toxic metabolites leading to death have to be identified and their safety towards non-target organisms confirmed
- Their persistence in the environment as well as the compatibility with over means of aphid control must be verified in a view of a broad integrated pest management



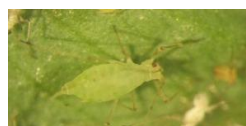
*Metarhizium* sp.



*Metarhizium anisopliae*



*Aspergillus clavatus*



*Acyrtosiphon pisum*